

From 45¢  
**PS**  
1960

THE  
PREVENTIVE  
MAINTENANCE  
MONTHLY



1950

# TELL THE MAN



You've got equipment to maintain and you've got problems... right?

You're short on time, help, tools, parts, publications?

It leads the everything gets in the way of keeping your equipment maintained and ready for combat?

You've tried to solve your problems, but just can't seem to make any headway?

Then, there's one man you've got to give the word to as you've met with it. Tell him—your immediate superior, whether he's your squad, section or platoon leader, or maybe he's your Commanding Officer.

That's right. He's the man who'll listen closest when you're stumped on getting maintenance done.

Why? Because without good maintenance, it's his unit and his equipment that won't fight better in the showdown.

Also, all 750.00 says it right on the line... says he's responsible for keeping his unit's equipment combat-ready.

So, tell **The Man** your problems.

We can make sure you have enough help. In fact, he can arrange for training team or drivers, mechanics, craftsmen, equipment, parts, supplies and facilities.

We can make sure that enough time is allowed on your unit's training schedule or operations, plus so that maintenance can be done.

We can give that extra push when there's no way in getting tools, parts and jobs.

So, there's no point in beating your head against the wall when you're stumped on maintenance.

Tell **The Man**. He'll guarantee for you 100 per cent.

**PS**

THE PREVENTIVE MAINTENANCE MONTHLY

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Managers Don't Get In Condition  
Having Working Time Matters More Than Money  
Customer Service: The New Way To Get The Job Done

Customer Service: The New Way To Get The Job Done

# SOME LIKE 'EM



Is it ever so handy when the weather cooperates in a favor on the range... or even on duty... or anywhere, when the necessary camping location is just what you need... giving you the ideal it should. And the best if you follow a few rules and use them.

Don't waste what kind of snow you're given, an M108 Yellow or an M1041 Tan because a Mountain Division 200,000-BTU job on the like for big chills... is a real pinch when an M108 cooking stove or an M1041 heater. Every bit of it 's worth involving care in long periods.

## WHEN YOU GET IT

One thing you do when you get that snow or wind snow is to see that all the gear, tools and accessories are there... and in working order. In other words

Report It—Check your TM's and M's for the parts, tools and accessories you need... don't wait. If you don't have them... don't wait. If you can't be sure, report 'em right away.



# HOT

WELL, WE'VE GOT A HOT PLACE TO GO.



But in My-News, follow your own's TM map by map to assemble it. And be sure the stove won't be too hot to look at the eye.

Try It Out—Finally, give your stove a quick test—following the TM, of course. Use just enough fuel to warm it up good. After you've checked it out, shut it off and clean it up... it's ready when the real time comes.



**WHEN BURNING LIQUID FUELS (LIKE KEROSENE, GASOLINE, AND FUEL OIL)**

**DO'S**

1. Make sure all storage containers are tight and the necessary vent chains are attached tight.



2. Hang the stove on the burner's shelves; otherwise it will spread or even blow onto the stove.



3. Place the burners so they'll be pulled down by weight. If not, lay a brick across the feet to hold it.

4. Turn the top valve down partially in a case to change the thrust when you adjust the burner.



5. Shake the fuel into regularly adjust or recheck it to keep it steady flame.



6. If the flame consistently goes out, clean the dip valve pipe. When the screen is clogged, wipe up any excess fuel inside the screen. Then run 2-3 minutes before relighting it.



7. Keep all fuel supplies outside the tent, truck, and in certain areas will probably be the low temperature you don't have any in cold weather.



**DON'TS**



1. **NEVER** fill the fuel tank before the fuel cools.



2. **NEVER** leave the stove unattended.



3. **NEVER** use a liquid fuel in a cold weather.



4. **NEVER** attempt to light the burner if the stove won't light. Turn the fuel tank.



5. **NEVER** use a liquid fuel in a cold weather.

**DO'S**

1. Fuel fuel in small amounts. All the fuel is burning brightly.



2. Remove all obstructions prevent the grate from being pushed.



3. When you add wood, push the fire back to the rear and give the fresh coals on the front. This way the gas from the back will be burned off in the front over the fire coils.

4. Be sure to brush the spark arrester on your grill when using coal fuel. Pull out stove on stock shifts and long burning when the spark arrester is not by the wind.



**WHEN BURNING SOLID FUELS (COAL OR WOOD)**

**DON'TS**

1. Pour gasoline or oil on the fire, either to start or to keep it going.



2. Let the stove burn before the grate that when it cools and the grate.



## EDDY WEATHER EDD



**Ventilation**—No matter how cold it gets outside, always be sure some fresh air circulates in your area. Exhausts gases from partly-burned fuel have a nasty habit of wanting for attack on humans.

**Overheating**—And no matter how cold it gets, never let your stove run full blast. Very important. Could overheat the stove pipe and set the area on fire, or might warp the stove body.

**Support and Protection**—When the wind's a gale, you've got to make sure the draft diverter on top of the stack is well anchored. You'll need these guy lines to do it right.



## DOES IT BURN?

Some stoves need special care...like the MIFCO one-burner, for instance. Never fill the tank of these one-burner's more'n 5/8 full 'cause extra fuel under pressure will make the flame flare up when lighted.

Another thing, in extremely cold weather y'might have to pre-heat the one-burner twice its quick order to get it started right. It may also be necessary to pump a few extra strokes off and on to maintain operating pressure in the tank.

But in the mountains it'll be just the opposite. Gasoline vaporizes faster at higher altitudes and if you pump more pressure than's needed you might flood the burner or make the flame too high. Could be bad all around.

You've got to shield the working stove from strong winds, too, 'cause high winds could put out the flame or keep it from doing a good job.





If you're the keeper of a Husvarn-Nelson 250,000-BTU snow blower, you'd best be on the lookout for a couple things in seasonal weather. Like for instance, ice forming in the exhaust stack.

What happens is this: Engine exhaust gases escaping through the economizer blades, solenoid and collector contain some moisture which tends to collect and freeze in the stack. Also, always put a cap on top of the exhaust stack to keep ice and snow from collecting on the screen screen when the blower is shut down.

### KEEP 'EM HAPPY AND SHE'LL...



Once a week, whether you think the work is or not, give her a good top-to-bottom going over.

Fix any defects you find right off—or have someone's check 'em. Apply medium oil to the snow body and to all parts showing signs of rust—especially the spark wires and/or the deck drums.

Remove the snowpipe. Take the screws apart, clean 'em good and then put 'em together again. Make sure all the screws are right. Replace any that are damaged.



In some ways a test snow's like a girl. Treat 'er right and she'll be right by you. Neglect 'er and watch her.

With the liquid blower: Operate the adjustment and shield levers to see that they work properly. Inspect the float valve to see that it's correctly mounted and properly adjusted and that the controls are not damaged.

Check the fuel passages and fuel lines for leaks. Keep the small holes in the burner gas line from carbon, rust and rust by cleaning 'em with a rag soaked in wooden peg. But be careful not to collapse the holes.

The burner of the gas should be kept reasonably clean, but don't scrape it. A thin layer of carbon protects the metal and aids in starting a fire.

The float valve assembly—the whole valve, in fact—should be removed from the stove and cleaned with gasoline OUTSIDE the stove. Here's the way to do it: Disconnect the valve from the burner and connect it to the fuel tank. Then lift the flow-adjustment knob and let the gas flow through the valve body. After it's all nice and clean, install the fuel assembly with clean fuel.

Here's the way to clean the burner assembly on your Yellow stove: Close the dip valve and allow the burner to cool. Then lift the wire loop and the remaining stove to the side so that the burner assembly may be removed from the stove. Next, take out one of the cover pins holding the burner body to the burner cap and allow the burner body to swing down. The second cover pin'll act as a hinge in this deal.

Then with a knife or sandpaper scrape the carbon deposits from the burner body and cap. And when both surfaces are clean, reassemble the burner and replace it in the stove body.



ONE LAST WORD ON SAFETY: A BURNING STOVE WITH A DISCONNECTED GAS LINE IS A SERIOUS FIRE AND EXPLOSION HAZARD. BE CAREFUL! ALWAYS USE THE SAFETY PROCEDURE FOR THE STOVE TO WHICH YOU'RE WORKING. THE SAFETY MANUAL SHOULD BE WITH YOU AT ALL TIMES. TRYING TO GET GAS FROM A GAS LINE IS A SERIOUS HAZARD.

THESE ARE THE PAGES TO GET FAMILIAR WITH:

- EM 10-728 134 Feb. 55 -Yellow Stove
- EM 10-729 24 Jan. 55 -Stove, 36, Inc. #2441
- EM 10-730 1 2 Jan. 55 -Stove, Fuel, Gasoline, 754, 755 #24
- EM 10-731 287, 521 -Stove, Cooking, Gasoline, 8 732 See  
in Book
- EM 10-732 244, 521 -Stove, Intermediate Page



# LIMBER 'EM UP



One of the first things you do when you wake up in stretch, right? Get your blood circulating, get you on the ball . . .

Same thing should be true for all kinds of vehicles and equipment that have hydraulic systems. Hydraulic muscles need flexing out before going to work.

This goes double for equipment that's exposed to freezing weather. Cold weather makes the oil sluggish, lets up condensation in the oil lines, etc.—all of which add up to a checky team that needs loosening up before work begins.

There's time for vehicles that don't get full-range exercise of their hydraulic muscles during a regular day's work. You know, lifting just so high, lowering just so wide or tilting just so far—in a particular job calls for. And, of course, any equipment that's been idle for a spell needs a little warm-up exercise.

No matter what kind of work your equipment's doing, make it a habit to give it a brief workout—some spring-up exercises—first thing out each day.

Spring that boom, lift that fork, or tilt that mast a couple times as far as they'll go. This'll do the trick.

And do it before you even start—*not* after the equipments have moved out ten miles on the job.



*Illustrations by Bob Schmitt. The author is a former equipment editor for *Construction Week*, a national publication for equipment dealers and users.*



When Getting a Good Vehicle  
Relays a System, What First Is ...

# SLAVING SLEUTH



To get your diploma from the School of Mechanical Vehicle Degree Acquisition in Wiring Systems, Professional Program Number C-601-Cable, all you gotta do is read and heed this primer. Cable from this school will come in handy on breaking morning when your vehicle's business get too low to run over the engine.

Before you even get to the low-volt method for slaving, you oughta check your vehicle's start equipment and the slave cable you're going to use. Here's the A.B.C.'s on how to do it.



## RECEPTACLE



A few vehicles have been found with their slave receptacle wired wrong—their negative wire hooked up to the positive lead/rails receptacle and vice versa. This can lead you to bad things—and murder for your vehicle's electrical system.

A quick way to check out your receptacle is to use a test lamp. With the master relay switch OFF, and the engine and ECU just OFF, hook up one wire to the receptacle's positive lead and ground the other wire to the vehicle. If it lights your lamp, then you know the (positive) (+) lead is how this is should be. If it doesn't light your test lamp, the receptacle is hooked wrong. To check out the receptacle further, try the negative wire to the ground. If this lights your lamp, that confirms that the receptacle is hooked up wrong.



## It's right the wrong

1. Check over the master relay switch is OFF.
2. Take out the starting cap screws.
3. Tear down the receptacle.
4. Switch the leads so that the low-volt will be in the positive lead, the one marked (+).

Remember, when you do this jump the master relay switch OFF, or you'll be working with a live wire. A 24-volt can give a nasty burn.



## SLAVE CABLE



Before you let that slave cable from the live (slaving) vehicle make your way make sure the wires within that cable are not crossed. If the wires have been assembled in the wrong terminal point you'll get reversed polarity—and a disturbing shock for the dead vehicle's electrical system.



If it's a more subtle one, if you're not sure it's OK, check it out. Again, using a test lamp, plug one end of your slave cable in the live receptacle. On the other end of the cable, you can plug back the test lamp so the job then will come with the



donor receptacle's positive (+) bulb and ground the other wire to the live vehicle. Turn the master relay switch ON. If no lights, your lamp, you're set. If it doesn't register, the fuse are correct. To get 'em straight:

1. Remove the screws in the slave cable lead.
2. Disassemble the terminal and change the pins or wires as the live pin is pink/red to mate with the live (+) receptacle hole.



### PREPARATION FOR SLAVE STARTING

Now that you've checked out the slave cable and the slave receptacle you're ready to spring your dead vehicle with a live one.



JUST ONE MORE THING BEFORE YOU GO...!



1. Go over the water level in the batteries with the dead vehicle before the jump.



2. Put the battery cell-level terminals on tight.

On dead vehicles that have no auxiliary generators, you should always load your L/T for and use it to charge the batteries or start the engine. When starting the main engine with L/T for, keep the master switch OFF until the engine's running. That'll keep the live batteries from putting an extra load on L/T for.

There'll come a day when you may want to use a slave cable to charge the batteries in a dead vehicle instead of starting an engine. If this is so, with both the master relay switch OFF, get the slave cable connected. Then, turn your live

### BATTERY

### OFF WHEEL

### SLAVE STARTING

### ON WHEEL

1. Turn the live-lighting you want to use to get your vehicle's engine to the slave cable to make both the live and dead vehicles.
2. Turn OFF the master relay switch in BOTH vehicles. Remember, it both switch the master switch ON, OFF and master OFF. The lamp are wrong when you connect the slave cable.
3. After plugging in the cable live light vehicles, turn OFF the master relay switch in the OFF starting vehicle and start its engine and it'll be about 15-20-30-40 and being brought up to normal operating temperature.
4. In the dead vehicle which keep the master relay switch OFF and start its engine in the normal way ...

... connect the OFF from ON in the OFF's slave receptacle is installed so that no vehicle current comes get to the master until the master switch is closed ... so when starting the vehicle turn OFF the master relay switch. But turn it ON again (practical case) as the engine starts and keep it off until the cable is disconnected.

Why be so careful? You don't want any current flowing through your cables when you're making or breaking connections—otherwise you'll damage the connections by arcing. And so would any danger of fusing up the two vehicles' electrical circuits by having two generators charging without any paralleling circuit.

5. As soon you have your dead fuel running, turn off the engine and master relay switch in the starting vehicle. Then, remove the slave cable from both cars as quickly as possible.
6. After it has long you connect as the master relay switch in the dead vehicle in the generator so that changing the battery and bring 'em up to you.

### CHARGING

vehicle and turn the master relay switch ON in the dead vehicle. That'll put the live batteries into your live vehicle charging circuit.

If you don't have another vehicle of the same size—well, any old one's available in a Jeep to use a master—don't say because the big tank engine with a cable from the Jeep. You can see why—the Jeep doesn't have the battery capacity for the work. But you can charge the tank's batteries by hooking in the Jeep and running it at a fast idle for some 30 minutes. Watch, this is only used when normal charging cable for emergency situations.

## MORE POWER TO YOU

There's one more situation where you might want to use a slave cable. This is to supply current to run the electrical accessories in a vehicle which has no battery. There's no point here in turning on the master relay vehicle—except in the MCI's case with no battery in the vehicle the positive cable may be lying in such a position that it can cause a flashing alert.

## MASS PRODUCTION SLAVING



In places where vehicles are moved and battery-less like National Guard or Reserve units—it's easier to start up engines and accessories than by using the slave cable from another truck or from an extra set of batteries transported on a van or truck. This eliminates the extra work of installing the vehicle's own batteries. Here again, always use a set of batteries that are as close similar to the batteries in the vehicle you're going to start.

When using the batteries from a slaving vehicle don't forget to shut OFF the first truck's engine when the dead vehicle is able to run on its own—that is, if you keep the slave cable hooked up. You don't want two generating systems trying to charge the same batteries without a paralleling circuit.



IN ALL CASES, FOLLOW TO THE  
LATEST ISSUE OF **SAVED** **FREE**  
**FOR SLAVING PROCEDURES.**

70-00110

SAVED  
SAVED  
SAVED

## COLD WEATHER SLAVE KIT

For you men stationed in long unpopulated areas there's a self-starting aid kit known as N40, P/N 2140-170-1208, to help you out with your starting problems.

This slave kit is made for use when ambient temperatures are subnormal—energy to start engines in temperatures as low as  $-20^{\circ}$  F. In an emergency, the slave kit can be used to charge a vehicle's batteries with or without the slave accessories. For the holidays you might look up 70-00110 (14 and 22) including Charge 1-24 (see 14). To find out if your unit is on N40 slave kit, take a guide of 28 0-11 (2) 0014.



## *Connie Radd's* *"TRICK 'N' TRICK DEPT."*



### *Trick with Trick*

Here's a rope trick that helps beat the day hazard of having left-over goodies in the make of engines, saws, blowers and the like that's in storage in your unit.

Take a piece of clean 1/2-in. cotton rope (never hemp or manila) like that and drop it into the tank so that it reaches bottom and connects the remaining fuel. Make a knot in the rope at the filler neck (or other opening) so neither is as it'll milk out.

The rope'll make like a wick and help the fuel out of the tank into the open where it'll evaporate fast. Be sure you have plenty ventilation.

It's a good way to get rid of the problems of fumes and flames, which could be real dangerous. And it sure chews the wax off the impurities too.

### *Job Smoker*

Will you be glad in your Jeep engine with the Castrol-type filter? They're the ones that come with your M36's and early M38A1's.

If your quartermaster's still wearing his original equipment, you need to visit him up several times for each day's operation to keep that plug-out the oil.

Four or five complete months ago... you just see him here people here breathing.

You'll find the plug on this in Change 5 (18 Jan 50) to TM 9-6042 for the M36. If you don't see it in TM 9-6044 for the M38A1, it's because most of the M38A1's have another type of filter... the military cartridge. It's got no handle at the top to be twisted.

The military cartridge is the preferred item for filtering oil, but as long as Castrol are available, they're to be used until the work is done.



From Castrol, look for the oil, if you need a new head.



In the other hand, the military cartridge type can be removed by slipping a screwdriver around.

Keep a sharp eye on the PIN's in the Chd 7, though, when you're ordering new guns for these lines. Don't let the word "cartridge" throw you.

With Filters, call any PCaint—800-294-737-5466—your filtering unit in hand, to Cartridge, call PIN 294-737-5466.

With Filters, call any Cartridge type—PIN 294-201-0614—your filtering unit in hand, all Stop, to Gunter—PIN 294-211-0611.

Like oil and water, these units don't mix. And if you change over to the military cartridge type filter, you'll need to take it up with your Ordnance support, 'cause you're gonna need different hardware to hold this new-type filter.

## Spread 'em out

Some M11 APF units have having trouble with some hole hooks that won't fit around the perimeter. If you're in this spot, don't pull out your hole-grab your Jeep's hand jack for a operator.

This is the new-type job  
... PIN 123-24-254 ...  
that's a post leg's job. By  
gluing the job like shown  
here, you can spread with it  
three right holes to get an  
M11 to fit with a 1/2 inch  
tolerance.



But cracks that jack handle show and say. Your hooks are made of low grade carbon steel that won't take kindly to any welds made necessary by Currier branch. Besides, most of the hooks being used this trouble probably won't have to be spread more than 1/2 inch. You can leave the hooks right in place for this job.

## *Slippin' and fallin'*



Kills on the wet, hot platform of the M44 MP tank and the ramps of the M55 APC and M44 MP mortar can get mighty slippery at times. Especially when the regular coat of mastic paint gets worn and then is mixed with mud, water or gas.

Here's something that'll solve this safety problem right quick. It's called Bonded walkway compound, non-slip, rough O.D., MIL-P-181175A, FSN 5508-170-8000 gets you a 1-gal can from the Engineer.

This paint will take about four hours to dry and then should reach its full hardness in about 24 hours at a temperature of 70° F. You can spray, brush or trowel it on.

## *Put 'em up*



Whenever it comes to parking your M100AL, 1000-gal semi trailer gas tanker, there's something you should do before you sleep in from your tractor.

The two pads that go under your landing legs should be taken out of their rolls and placed under those legs. This is so the legs'll rest on a good solid base—especially on soft or uneven ground.

There's another job, not so easily noticed, that these pads do for you when you place 'em under the legs. Water can collect on the top of your tankers, along the vertical drum walls—the pads'll help take the front end of the tanker and let a lot of the water run out the drain hole at the rear.

You want to get in the habit of using the pads and they'll be a big help keeping that tanker in shape.

## Your M&M's here?



Maintenance allocation charts are now running our show at least as strongly out of a megaphone. This is something you want to be on the lookout for—these charts give you something to stick your teeth in so to speak you're responsible for on your vehicle... and who does the other maintenance jobs.

To take a gander and see if these allocations apply to you:

VEHICLE	MAINTENANCE ALLOCATION CHART
802101 van -Shelby	75-1-254/Shop 1-29 for 18
802111 van -Piper	75-1-251/Shop 1-29 for 18
804101 Bu -P. loader	75-1-251-Shop 1-29 for 21
804111 Bu -P. loader	75-1-254/Shop 1-29 for 20

## Away all bolts



Before yanking the top-lock cover off your M&M's series machine tank, with the M&M's wrench's case... best make sure you take out all the hold-down bolts.

Some of your buddies are Kaptain's to pull out the four front bolts on the cover bar—two on the left and two on the right. They're easy to forget... 'cause you can't see these bolts without looking for them. If these bolts aren't out, they'll show when the cover's lifted.

You ought add a special check on the M44P's... because some vehicles in this series have L71 jet mufflers mounted to the underside of the top deck. It's just as much a good move lifting the top-deck cover without loosening the auxiliary muffler clamps. The result is a mounted-up muffler. But if your vehicle's got an auxiliary engine muffler attached to the frame you're got nothing to worry about on this issue.



## *When filters go off*

That's the time to get rid of them. You'll find your truck's main filter wheel assembly hidden on top of your M44-series intake—check MPOD 9-2400-201-20 (1 for 10).



It tells you to remove the assembly and close up the openings with two covers... ERM 2400-201-2014. But if you have trouble getting the covers—or run into a lot of trouble with filter trouble—here's a fix you might want to try between now and rebuild time:

1. Cover the area around the filter assembly with asbestos.
2. Cut the filter area off with your very best torch, leaving the area support in place.
3. Grind down the sharp-edge left by the torch, then paint over.

Instructions on how to use our many TV series are included.



When rebuild time, those people can remove the remainder of the area and its support—then close up the openings with these covers.



to Cool-It's Power  
to Push.

## YOUR GARWOOD



Your crane-shovel units—crane or truck-mounted—can be pretty handy rigs for any work to have around. With a wide assortment of attachments, they're the answer to a lot of your construction problems.

Regardless of the make or model, all your crane units have a lot in common. Given the right PM, they'll help you handle most of your maintenance projects with no sweat.

**CRANE**—Lifting capacity somewhat restricted. (This applies mainly to **boom** models.) Some models, if lighter-duty, can deliver main hoists and not a sub hoist. (This is not a drawback.) **Winders**—Lifting, rotating. **Drum**—In general, winding, don't open, don't tighten.

**LIGHTS**—Highly visible. Make lights, lower lights—Lenses dirty, lenses missing, defocused, cracked.

**WIND-DRIVEN**—**Turns**, badly. Hoist, large hoist, hoist not hoisting hoist.

**DRUM**—Doesn't rotate, belt missing.



**DRUMS**

## CRANE-SHOVEL



You can keep your rig in top shape and, at the same time, make 'em grippier if you take care of such deficiencies as it crops up.

Take your Garwood as a **CRANE-SHOVEL**—that's what you want to look for on your **REPAIRS** on your **MMB**. Generally you can use this guide for any crane-shovel of the same type.

These major deficiencies are in **heavy type**. They're the ones that could make your work unsafe or expensive... cause extra wear... or lead to a breakdown.

### GENERAL

### APPEARANCE

**DRUM**, **WIN**—Winding, missing, cracked, not visible.



**MISSING DRUM COVER**—Cover dirty, distorted with excessive wear.



**DRUM**—Doesn't rotate or **grinds**, all disks or gears or multiple any disk.



**FRAM**, **LOAD**, **BEARING**—**Doesn't** rotate, **broken**. Bearings, rollers, structural members, loose and unsecured, bent, damaged, missing, they work by moving from end to end.

**INSTRUCTION PLATE**—Missing, not readable, loose.



TOOL, TOOL-BOX, 24 Hours  
 Close, Order on open.

TOOLS, EQUIPMENT—See also  
 also, listing, photograph, record.  
 See also this title, you may find the  
 B.2421 or B.2422.



CALL, OPERATIONS & MAINTENANCE  
 SERVICE UNIT—See also, Repair.

## COMMON TOOLS

ISBN	BOOK PRICE	DESCRIPTION
0-09-224-127	95	Box, Tools, 24-in
0-09-224-128	95	Box, Tools, 24-in
0-09-224-129	95	Box, Tools, 24-in
0-09-224-130	95	Box, Tools, 24-in
0-09-224-131	95	Box, Tools, 24-in
0-09-224-132	95	Box, Tools, 24-in
0-09-224-133	95	Box, Tools, 24-in
0-09-224-134	95	Box, Tools, 24-in
0-09-224-135	95	Box, Tools, 24-in
0-09-224-136	95	Box, Tools, 24-in
0-09-224-137	95	Box, Tools, 24-in
0-09-224-138	95	Box, Tools, 24-in
0-09-224-139	95	Box, Tools, 24-in
0-09-224-140	95	Box, Tools, 24-in
0-09-224-141	95	Box, Tools, 24-in
0-09-224-142	95	Box, Tools, 24-in
0-09-224-143	95	Box, Tools, 24-in
0-09-224-144	95	Box, Tools, 24-in
0-09-224-145	95	Box, Tools, 24-in
0-09-224-146	95	Box, Tools, 24-in
0-09-224-147	95	Box, Tools, 24-in

See also B.2421 or B.2422.

## SPECIAL TOOLS

ISBN	BOOK PRICE	DESCRIPTION
0-09-224-148	95	Box, Tools, 24-in, 24-in
0-09-224-149	95	Box, Tools, 24-in, 24-in
0-09-224-150	95	Box, Tools, 24-in, 24-in
0-09-224-151	95	Box, Tools, 24-in, 24-in
0-09-224-152	95	Box, Tools, 24-in, 24-in
0-09-224-153	95	Box, Tools, 24-in, 24-in
0-09-224-154	95	Box, Tools, 24-in, 24-in
0-09-224-155	95	Box, Tools, 24-in, 24-in
0-09-224-156	95	Box, Tools, 24-in, 24-in
0-09-224-157	95	Box, Tools, 24-in, 24-in
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0-09-224-159	95	Box, Tools, 24-in, 24-in
0-09-224-160	95	Box, Tools, 24-in, 24-in
0-09-224-161	95	Box, Tools, 24-in, 24-in
0-09-224-162	95	Box, Tools, 24-in, 24-in
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0-09-224-169	95	Box, Tools, 24-in, 24-in
0-09-224-170	95	Box, Tools, 24-in, 24-in
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0-09-224-197	95	Box, Tools, 24-in, 24-in
0-09-224-198	95	Box, Tools, 24-in, 24-in
0-09-224-199	95	Box, Tools, 24-in, 24-in
0-09-224-200	95	Box, Tools, 24-in, 24-in

**PUBLICATIONS—See also, available. See's what you should know.**

REGISTRATION, LABORERS' UNION	0-09-224-199	Special's Record
0-09-224-200	0-09-224-201	Specialized Maintenance Manual
0-09-224-202	0-09-224-203	Specialized Repair Parts
0-09-224-204	0-09-224-205	
0-09-224-206	0-09-224-207	
0-09-224-208	0-09-224-209	
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0-09-224-492	0-09-224-493	
0-09-224-494	0-09-224-495	
0-09-224-496	0-09-224-497	
0-09-224-498	0-09-224-499	
0-09-224-500	0-09-224-501	

## INSTRUMENT PANEL



**TEMPERATURE GAUGE**—One low limit, moving. **Needle breaks, moving.** Registers low or high to engine. Registers above 200° F. Operating temperature should be between 160° and 200° F.

**oil PRESSURE GAUGE**—One low limit, moving. **Needle breaks, moving.** Falls to engine. Big part below normal high. Gauge indicates 40 PSI operating speed—can be as low as 15 PSI at idle.



**INSTRUMENT PANEL LIGHTS**—Reflector moving, left hand set, moving. **Wires breaks, lamp dead.**

**IGNITION SWITCH**—One broken, moving. **Needle breaks, moving.** Falls to engine when undriven while engine is operating.

**STARTER BUTTON**—Broken, lamp connection, moving.

**IGNITION SWITCH**—Lamp connection. **Broken.**

**TACHOMETER**—One broken, moving. **Needle breaks, moving.** Falls to zero when engine is running. Operates above 1,200 RPM with no load, and 1,600 RPM with full load.



**AMMETER**—One broken, moving. **Needle breaks, moving.** Falls to engine. **Needle shows discharge when engine operating.** Indicator should show 2.0 amp charge with engine running. On slow high charge temporarily right after starting.

**LOW FUEL OIL**—Broken, lamp connection lamp.

**THROTTLE LOCK SWITCH**—Lamp test lamp. Lamp moving, fly.

**STOP BUTTON**—Broken, lamp connection lamp.

## CONTROLS



**LEVERS, PEDALS, (THROTTLE)**—Locally mounted. Not linked. No, linkage. **Linkage wrong out of adjustment.** (also fail to hold, linkage excessively loose, springs, control pins, bolts, loose or missing).

**STOP SWITCH**—Lamp linkage. Lamp, moving out and back. Falls to stay before completion.

**THROTTLE STOP**—Pin, spring, link up wire. **Excessive play.**

**CHISEL**—Fails to stop in gear and  
problem. Insufficient torque, bent.



**PINION**—Fails to operate, heavily  
worn.

## DAVE SYSTEM

That Dave  
can't stop in  
gear is a  
problem of  
an old  
worn-out  
chisel  
and pinion  
system.



**WATER CLUTCH**—Leaks, dis-  
torts while being engaged. Slips  
when fully engaged. Hard to  
engage, slingshot. Slings when  
being disengaged.



**OPERATING CLUTCH**—Coil,  
Coast, Roll-in-02 gears are  
being. Break, being worn. Full  
over wear, pin, hole, surface  
wear, out of alignment.

**BEARING, GRAFTS**—Bearing  
cap, surface hole, missing or  
loose. Excessively worn, shear  
lip bearings. Hole out of  
line.

**ARM-ON CLUTCH**—Excessively  
worn, not properly adjusted, will  
not engage, slingshot.



**OPERATING BRAKE**—Excessively  
worn. Shows wear  
down. Being of metal. Spring,  
hole, pin, hole hole, wear or  
missing.



**DRUM, PINION**—Worn, dis-  
engaged. Excess gear motion dur-  
ing operation.

**DRUM, BRAKE**—Excessively  
worn. Not locked. Break, break,  
surface slingshot, loose, missing  
hole.



**CRANK**—For gears, **linking**, **braking**, **axial** or **axial** **axial**, but **axial** **axial** or **axial** **axial**.



**CRANK HOUSING CASE**—**link**, **braking**, **axial** **axial**, but **axial** **axial**.

**CRANK HOUSING CASE**, **CRANK HOUSING**—**link**, **braking** **axial**, but **axial** **axial**.



**CRANK HOUSING CASE**—**link**, **braking** **axial**, but **axial** **axial**.



## FUEL TANK

**FUEL TANK CASE**—**link**, **braking** **axial**, but **axial** **axial**.

**FUEL TANK CASE**—**link**, **braking** **axial**, but **axial** **axial**.



**FUEL TANK CASE**—**link**, **braking** **axial**, but **axial** **axial**.

## ELECTRICAL ITEMS

**BATTERY**—**link**, **braking** **axial**, but **axial** **axial**.



**BATTERY**—**link**, **braking** **axial**, but **axial** **axial**.





## ENGINE (Right Side)

**COVERHOSE, LOWER**—Replaces upper of top speed without leading. Mounting bolts loose, missing. Linkage not lubed, bent, loose.

**CAMSHAFT, (INHALE)**—Bent, broken, missing bolts, screws, missing lug, loose. Linkage bent, worn. **Loose**, Corrosion loose.

**SPARE PIVOT**—Dirty, loose, cracked, fitted contacts. Wrong spec. (Should be 6.00 in 1.00 in).

**LE-CLAMP**—Loose, bent. Dirty. **Oil level low**. Check for oil spec of 100. **Corrosion**—Ripped, Corrosion, seal worn.

**VALVE, EXHAUST**—Loose, worn, cracked, bent. Loose loose in timing.

**WIRE RUMP, HOODING**—**Loose**. Missing mounting screws, loose, missing. Worn, dirt in contact. Seal, loose, dirty, cracked, worn, cracked.

**FUEL FILTER**—**Loose**. Air, clogged, water in contact level. Loose, dirty. Corrosion, worn, cracked. Cracked, clogged, glass.

**STARTING MOTOR**—**Loose**, missing bolts, wiring loose, excessively frayed. Corrosion, bent, broken, dirty, worn, loose.

**PISTON**—**Excessive** shatter, loss of power. Valve cover gasket cracked, worn. Check for timing lockup timing, loose, excessive slack.

**VALVE HEAD, MANIFOLD**—**Loose**, loose, missing mounting bolts, nuts. Excessive, cracked.

## ATTACHMENTS

**BEAM ATTACHMENTS (SAWS, GRIND, SANDER):**— *Cords, handles, and lower mounting brackets. Sawing, sanding, grinding, and cutting attachments. Foot pins are usually worn. Damaged lower block.*

**UPPER MOUNTING BRACKET, CLAMPING (SCREW):**— *Cords, handles. Sawing, sanding, grinding. Lower, mixing belts, belt. Usually worn upper clamping bracket, lower, pins, bearings, rollers, bearings, and Douglas bracket shoes.*

**BEAM MOUNTING CLAMP:**— *Bearings, bushings, usually worn. Beads, wear, belt, rollers, wear, rollers, metal, mounted, clamping brackets. Lower, mixing, dust-lugging, mounting belts. Broken lower, or clamping.*



**CLAMP:**— *Not set below. Usually mounted. When set, clamps, roller, or tips, rollers, clamping, feet, there is that they don't set.*



**UPPER SHIRT, SANDER BLOCK:**— *Usually wear, wear plates. Upper, with belt. Gear, sprocket, wear, lower.*

**UPPER AND MOUNTING (SCREW) AND SANDER:**— *Cords, handles, or upper handles, wear, broken, tips.*

**UPPER UPPER, SCREW:**— *Usually worn, broken, lower, with, usually worn belt. When belt, long, belt.*

**UPPER:**— *Lower, mixing, mounting, belts. Usually worn clamping, rollers, pins, bearings, guide plates.*



**UPPER:**— *Cords, handles, lower, wear, mounting belts. When, clamping, rollers, pins, belts.*



**BEAM ATTACHMENT:**— *Lower, clamping, sprockets, usually worn. Clamps, rollers, for belt. Lower, rollers, wear, flat, pins, belts, bearings, broken, mounts.*

**FOR UPPER MOUNTING, GRIND, SANDER:**— *Lower, mixing, mounting, and sprockets, belts, and rollers, lower, lower, mounted, there, lower, broken. Cords, in, with.*



**UPPER ATTACHMENT:**— *Lower, clamping, rollers, bearings, wear. Lower, mixing, mounting, belts, or rollers, rollers, pins, not, lower, being, pins, plates, usually worn, damaged.*



**UPPER (UPPER) ATTACHMENT:**— *Usually worn. Bearing, adjustment, not, and, lower, lower, mounted.*

**UPPER ATTACHMENT (SCREW) AND SANDER:**— *Cords, handles, lower, mounting, and, usually, belts, pins, belts.*





As you can see, your post box didn't do the trick either. There was a Christmas card from Chester Sledge (name, by the way, name), New this year, and you'll love to hear he did not get his maintenance pay, especially around Christmas when this thing takes place.



2

ed to Rachel gave to his home on the first where his wife and little boy Tony (who found his leg in a Girls' Cooper game) left to start a life elsewhere.

5

of Sgt. Cleveland Duvigne would back to his post in the barracks (even though he had an invite from his mother, who is a "Warrior Officer").



WE GOT THE CHEAPEST COMPANY AROUND IN THE WHOLE DASH CORPS. I AMT WASTING NO TIME ON THAT MAINTENANCE JOCK... WHO BUY PARTS WHEN I CAN GET PARTS? ...LEAVE 'EM HERE NOW, MAYBE I CAN FIGURE HOW TO GET THEM OVER ROLLING.



THE OLD MAN HOLLERED ABOUT THESE DEADLINE REPORTS, BUT ITS LEFT 'N POLISH THAT COUNTS. LET'S SEE... I'LL PUT THE JUDGE BERKMAN IN CHARGE OF THE PAPER'S BEHIND ENTERING DETAIL.

W-H-A-T-T-H-E-N-A-M-C-E... (HER, HUH?) I'VE GOT THE BRIGHTEST BOARD OF CO. RIGHT IN THE ARMY. W-H, H-H.



5

ed in, after sitting a few hours back at the table (which could not print, George turned off the evening light over his desk and walked in... ending to himself over the story of the Coopers's "dared" Winning Teddy Bear game.

to get the idea.



MAINTENANCE... (HER, HUH?) I'VE GOT THE BRIGHTEST BOARD OF CO. RIGHT IN THE ARMY. W-H, H-H.



# Joe's Dope Sheet

I know  
what's  
best  
for  
you.

With just twenty-four hours each day,  
You've got to make PM time pay.  
Tho' that eye-wash is fine,  
It won't help on the line  
If your maintenance is frittered away!

WELCOME  
TO THE

3679th MED.  
TANK CO.

WE HAVE THE WORLD'S BEST EQUIPMENT ... *Take care of it*



at last, but the money disappeared. The soldiers he started to help  
 but he could be saved by them when ghosts Christmas Past, Christmas  
 Present, and Christmas Future, they were gone leaving him in trouble.



WELL... I WOULD  
 LIKE YOU!

I WAS THE CAUSE  
 OF CHRISTMAS PAST'S  
 DESTRUCTION THE NEW TYPE  
 GENERATORS YOU ORDER  
 LAST YEAR. ALL THEY  
 NEEDED WAS SOME  
 SPECIAL OIL!

WELL, I WANT ME TO STOCK A  
 SPECIAL OIL BY NAME! A REVOLUTIONARY  
 OIL I BORN IN THE SERVICE FOR  
 MONTHS WE NEED... AIN'T NO  
 PIECE OF EQUIPMENT IS MADE  
 THAT DELICATE!

WELL, COME...  
 WE GOTTA DO  
 IT GET A OAS BACK  
 TO SUPPORT... THEY'LL  
 PAY THE OIL FOR US.

**HUMBUG!**  
 IT AIN'T NO GOOD  
 AND THAT'S THAT!



BUT I WOULD  
 NOW ABOUT  
 DEFENSE?

WELL, COME...  
 WE GOTTA DO  
 IT GET A OAS BACK  
 TO SUPPORT... THEY'LL  
 PAY THE OIL FOR US.

WELL, COME...  
 WE GOTTA DO  
 IT GET A OAS BACK  
 TO SUPPORT... THEY'LL  
 PAY THE OIL FOR US.

I WAS THE CAUSE  
 OF CHRISTMAS  
 PAST'S DESTRUCTION!



WELL... I'M  
SURE...

WHICH  
MATTERS  
MOST?

...GIVE A MINUTE!  
I WON'T HEAR ME ON  
THOSE OBSERVATIONS  
CAUSE I ALREADY  
GOT THE OIL NOW...  
ACTED TWO OF  
THE (CANDID) BURNED  
LIFE FROM HERE.

OH!  
...WHAT ARE  
YOU GOING TO DO  
WITH THAT OIL,  
DAD??

WITHOUT SCHEDULED TIME  
NOW IF YOU'LL HAVE NO  
WAY OF PERFORMING  
PROPER MAINTENANCE...

I'LL SHOW YOU... I  
AM THE GHOST  
OF CHRISTMAS  
FUTURE... COME  
WITH ME, AND SEE YOUR-  
SELF AS YOU WILL BE.



SO MANY  
THINGS ARE  
GETTING BURNED  
HERE!

LOOK, SCOOBE, THERE'S A  
BIG FLAP... THE COMMERCIAL  
POWER HAS BEEN SHOOKED  
OUT... THEY'RE CALLING FOR  
YOUR GENERATOR...

WHEEZY  
BY DOW!

THEY'RE BUSY TRYING TO MAKE  
DEPARTS... THEY SHOULD'VE BEEN  
MAKING WHILE YOU HAD THEM  
HOLDING YOU DOWN!

OH!  
...WHAT ARE  
YOU GOING TO DO  
WITH THAT OIL,  
DAD??





## QUESTION AND ANSWER DEPARTMENT



### FELT FILLERS FALLING?

Dear Half-Mast,

You discuss about felt fillers on the main bearing of the Nike-Hercules launcher? If all the launchers were out in the weather for awhile, the fillers would erode and dropped out. How do we get new ones?

1st SSG.

Dear Sergeant SSG,

You don't.

Those fillers were put on the bearings by the manufacturer for shipping purposes. Makes no sense mind whether they fall out or you take 'em off.



### TUBE TEARS



Dear Half-Mast,

Para 11 of TM 9-1876-1 says all base tubes with injuries longer than 14 inch must be sent to flight section for repair. But our unit's been told to salvage all base tubes except 219 or less.

Why scrap tubes that only have small holes . . . just because the unit can't get jet patches or because the jet patching tool is broken?

SFC J. C. W.

Dear SFC J. C. W.,

That 14 inch must've come from a local SOP, Sarge. There's no Army authority for salvaging base tubes just because you're short of repair parts or tools.

TM 9-1876-1 (18 Feb 55) doesn't give the full story on tube repairs. Para 11



1140) of TB 9-2079-14 (27 Feb 57) specifies smaller chain size 5,000 feet is damaged enough to need depot repair and was economically repairable.

But even these small tubes may be economically repairable as field detachments if they only have seal tubes. And tubes that are size 5,000 and up may be economically repairable even if they have to go back to depot for repair.

In... regardless of size or cost... the post commander support decide whether these damaged tubes are economically repairable or should be scrapped.

## CHAIN CHANGES



Dear Half-Moon:

How can I get new chains to use in towing maintenance vehicles with the M20 Winches? They're always breaking, and I've told the only way to get new chains is in order the whole loader assembly.

Can you help me?

Dear Specialist J. R. M.

That's the way it's been with these winches. But, nowing "Y" universal type, has included chains which were to be had only when you ordered the winch.

Also, this assembly now has a new FSM that's different from the one in ORG 7 201-6744-134 Age 50. It's now FSM 4910-711-6876.



This assembly now can be ordered as a separate item. It's tagged with FSM 2000-675-5048 CG-146.

That'll cut down a bit on the extra parts you have to get to replace those broken chains—then you only need to run in the change.

## WHERE TO GO

Dear Half-Mast,

I understand there's been a changeover on which technical service is responsible for supplying the fuel for extinguishers for the MH series medium tanks. What's the scoop?

SFC G. H. E.



Dear SFC G. H. E.,

You understand right. The Engineers took over control from the Ordnance Corps on the fuel fire extinguishers that go in tracked vehicles.

The tank number was changed from FSN 2128-771-4474 to FSN 4210-201-6487 for all tracked vehicles—except the MH tank recovery vehicle which gets a cylinder under FSN 4120-206-5079.

But don't forget—Ordnance is still responsible for the lines, fittings and the way these fire extinguishers are fixed in the tanks. So, if you have any installation difficulties, get in touch with your O&A support unit.

**Half-Mast**

## ICE-PACKED GEARS

Dear Half-Mast,

Last winter when the temps got downed on our tracks, it gave me with a clattering noise like the gears were clashing up rocks... and no wonder. The pivot gear gear housing was packed up solid. It melted down in more'n a gallon of water.



How about leaving the drain plug out of the underside of the pivot gear gear plate on tracks to make it avoid this freeze-up?

Sgt A. R.

Dear Sgt A. R.,

Some water may collect in that pivot gear housing 'cause it's not completely waterproof. That's why there's a drain plug underneath.

## WHERE TO GO

If you take out the drain plug and give the boom a couple of turns before each weekly filling . . . like the directions in Note 15 of LO 9-BLE (15 Aug 57) say . . . it should take care of non-oxidized water. Also make sure you hit all low points with G.A. like it's shown in Fig. 111 of TM 9-BLE (12 Jun 51).

This should get the water out—*that is if it hasn't moved on its own*. Of course if the water's frozen at the time . . . as it's likely to be if the vehicle's parked outside in winter . . . you may need to move the vehicle into a heated building or close the ice on it'll flow. And if you skip the first post-rip post-bleeding h.L. of grease like the LO guys, there'll be no room for water to enter the housing.

Best take a look at para 70 of the TM, too, for info on maintenance operations.



Dear Half-Man,

Is an aircraft properly EDP if the fire extinguisher is not in it? I can't find any regulation that calls it out positively.

EPC M. B. M.

Dear EPC M. B. M.,

No, you won't EDP the aircraft for a missing fire extinguisher. Best dip and make doggone sure that before releasing it for flight, and everybody riding in it, knows the extinguisher is missing.

Then, make up a random regulation for your extinguisher like it says in par 70, AR 711-10 (18 Apr 50). Which really means that you get the same treatment as if the aircraft were EDP, but you don't call it EDP because it is, *positive* it not very smart—*to fly it without the extinguisher.*





## SPRING SPRUNG

You Bird-Dog handbar knows that the tailboom springs of your F-104's can't always stand the gulf made by a hard landing.

OK, as the supply people know about this, and a better spring is coming into the system. However, there are lots of the old springs, P/N 1310-100-0040, still in supply. And since it can't be said to be a safety-of-flight problem, these springs will have to be used and used up.

So all you can do is draw another spring from supply and install it, hoping for nice gentle landings.



## MOJAVE TAIL SHAFT GREASE LOCK

You heard about the danger of over-greasing the tail rotor drive shaft coupling on your little Sioux helicopter. Well, it runs out that Big Boyder rolls from the same school.



If you pump more grease into the tail rotor drive shaft's splined coupling right next to working full, you can set up any one of three conditions, and none of 'em are good.

Pumping the splines out full will force the shaft in, which puts undesirable and possibly destructive strain on the bearing supports. Or compresses the rubber coupling at the other end of the shaft, or both. And the other possibility is that you may force the cap in the forward end of the shaft, and force grease into the hollow shaft. This will draw it out of balance, and probably give you a frightening vibration.

OK, so they're working out a pressure-rated type grease fitting for this coupling—but until it gets here, your best bet is to back off the knurled cap before greasing, then pump grease into the fitting until it comes out around the spline. Then you remove the surplus grease, replace and tighten the knurled cap. Wipe up and the job's done.

## BEAVER BRAKES



For too many Beaver (22-221) brake parts are being redesigned.

Either someone's squirreling away a stock of brake parts "just in case" or else the brakes are not giving adequate service.

If the brakes are failing, you can help the design people out by sending in URR's (224 Form 667) on any Beaver brake failure you encounter. And they'd like to hear about any findings you have that don't last at least 150 hours, discs that go out with less than 200 hours, and any complete assemblies that fail for any reason.

With the data from the URR's they can study the problems and come up with better brakes.

And y' might gain the word that the tech inspectors will be most important if they find a hoard of brake findings in some such areas. Get any suspect back line supply channels too.

## FORM CHANGE FOR SCAMP



OK, as you've been sending your already-to-SCAMP facilities and getting 'em accepted for on DA Form 471. Just like it says in WCOMM-PAD letter of 12 Feb 58 and the new TB AFM 24-8 124 July 59.

As you know, the 811 takes the place of the DA Form 471 called for by the old TB AFM 24-8 124 Aug 57, so you'll use the DA Form 811 on all already-pur used to SCAMP.

HERE'S  
AN  
EXAMPLE:



You see that you'll just leave blank spaces in the blocks that don't apply to SCAMP type maintenance.

OK? Now, the whole ball of wax goes with the ferry pilot to the SCAMP contractor, who receipts for the records on pages three and four. The ferry pilot returns them to you. Page four goes into your file as "support accountability" (where your aircraft list) and you mail page three in.

11 Army Transportation Co (PUGGETT  
and its maintenance personnel  
PO Box 208, Alsea, Oregon  
PO Lewis, OR, WA.  
ATTN: TONG-PA



That's when the job is done the winging pilot will show on pages one and two any shortages of equipment or any special work not done. Page two is then given to the contractor as his receipt for the aircraft, and page one comes home with the bird.





## START YOUR SIOUX RIGHT



There have been some shared magazine drive shafts reported on upcoming general models (8-13-57).

The engineers feel this might have been due to the engine backfiring while starting. (Specifically to a spark occurring before top-center on an engine that was



cranking or running so slowly that the resulting explosion of the fuel charge caused it to kick violently backward to the preposition of great order and discipline among the magazine drive shafts.)

Now, the -1 will tell you that your standard magazine has the impulse coupling. A magazine impulse coupling does two things at the same time. As your engine is turned over, a dog sweeps the magazine, and a spring begins to wind up. The engine continues to turn until the dog releases the magazine-rotator, and at that time the spring sweeps the armature over, too. This gives you a better spark than you'd ever get from the magazine at cranking speeds.

At the same time, due to the period of engine rotation during which the magazine was held, and the spring was winding, this first flip and flop spark takes place at a later part of the revolution of the engine. That is to say that the spark is retarded.

Which is just what you want here, some way to retard your spark so that it will not come over enough to kick a slowly cranking engine backward.

The old -1 (line 11, page 2-8 of Ch 1, 8 Feb 57) told you to turn your magazine switch to BTTH when starting the engine. This works just fine 99 times out of a hundred because the slow turning left mag does not fire the engine, and the impulse-coupled right mag comes in with its hot, retarded spark to kick your engine off forward. Then as the speed comes up, your left mag runs in, and the impulse-coupled mag holding the right mag, you're off and running with both mags correctly timed.



But even in a case where everything is ideal for the explosion in your cylinder, and the left mag gives its little spark, that'll fire the charge, and kick the engine backward. Possibly blowing a mag drive, and really not good for it.



So, what can't you do? Don't make a bad kick. Don't make a bad mag only, what's wrong.



Then, just to make sure the engine fires, go on over to 3000.

She'll start just as promptly, and you've eliminated the slight possibility of a bad kick. You'll find these instructions in para 4-109 on page 4-53 of TM 1-11-144-2 (March 68).

The oil has been changed, and TMC 11-15-19 Feb-69 gives you the word.

## CHOCTAW HOSE

Take a quick look at the pump. Blue line on your main rear primary hydraulic system. (Item-58, Fig-4, Page 26, TM 1-11-144-4, Change 2, 13 Aug 68).

Couple of feet have carried away about an inch and a half from the pump fitting—possibly from being pulled too hard when they were put in.

Anyway, the manufacturer is working on a longer hose for use here, and it would be smart to look at yours early so when the new one comes along.



## SANDY HOOK?

Met the forward end of New Jersey—the surge bucket on your Electrolux (R.V.C.).

Some some of the boys have been having trouble with sand in the bucket jamming the micro-switches. So, through air gives a momentary no-load condition, the load leaves you. They tell us the boys don't like to take delivery on their jumps till's free in the air.

So why not give your bucket a real careful check-out and cleaning—free do everything you can to prevent dragging' 'em through sandy ground.



## BETTER BEAVER BRAKE VALVE

Friends, Beavers and Beaver trappers, lend me your ears.

It seems a small goof has resulted in foot-pushing brake valves in the 4000-series giving back two supply channels in an unmodified condition. Which



means they could be on your Beaver 11-204 now, or could be loaned to you for a replacement.

OK, this valve does work. But do trouble it, when it's in park position. I should you can't increase brake pressure, no matter how hard you kick the brake pedal.

So, first of all, check and see if your aircraft has these 4000-series valves in use. If so, bear you requisition the new valves, P/N 1300-215-015M (P/N 4000 BALT) and install 'em.

And in the meantime spread the word around so that you and your pilots and anybody else concerned to make us real Beavers get in the habit of always releasing and warning the brakes before starting the engine.

None of which relieves you of the obligation to have checks under your wheels any time the aircraft's engine is running except when you actually intend to move it.

## DON'T LET YOUR GUARD DOWN!

It was most embarrassing: Real professional pilot, with over 25 landings a week for the last seven weeks, all carrying passengers in the Beaver. He had gone a whole flight, however, lost his mind and saw old work horse, and wild-blue-yankee her.



He had a whole 120 feet of altitude when the engine quit. When his head fell up on the landing.

So now he's trying to explain why he didn't check the gauges before he took off, and the boss man isn't smiling.

No matter how much time you have, and no matter how dependable your aircraft is, you never never never reach the point where you can afford to kick the tire and fight the low crosswind.

## ONE DID, ONE DIDN'T— ONE IS, ONE ISN'T

Shoulder harness for the birds? Perhaps so, and for the birdless too! Believe it.

Two recent accidents are the case in point. In one of them an L-19 had an engine failure at low altitude for safe jumping. It was three feet above 5000 feet and totally deserted. The pilot and his passenger were properly belted and harnessed in place, and were only scratched.



While in the other case a man was found dead in a crashed helicopter—and his shoulder harness was not in use. There was every indication that had it been, he could have walked away from the wreck.

Simpler, isn't it. Then, what would the harness have done when didn't use it died.

## LET'S COMMUNICATE



### ~~The Right Position~~

You've all heard the old maxim about position being everything in life.

Maybe the man who made up that life's saying didn't quite realize it, but his words of wisdom were way to close to about plugs than about people.

Because a plug that isn't positioned right when it's done so there is no way it's going to have an operator with a live pin—or more. And if he hasn't got a pin straightener handy—well, that's the end of things as far as the plug and receptacle are concerned.

As a matter of fact, even though a pin straightener is brought to bear, there's a chance something will go wrong. Figure it this way: the pins on an 18- or 24-pin connector are not the strongest things in the world.

As a matter of fact, even they're here doesn't a good chance that they'll bend as soon as somebody starts straightening or working around with them in any way. They just aren't made to live and bend.

So position properly. When it's time to stick a plug into a receptacle, check where the ridge is on the plug—and then line it up with the matching slot in the receptacle.

That way all the pins on the plug will slide smoothly into all the holes in the receptacle. Any other way and you run a dangerous risk of breaking one a plug—which could mean knocking out the whole electronic rig.



## Early Solution



Naturally you want a heavy or wrap things up... get the bench closed... and head for the gas. Fine. Who doesn't like why not make two last checks on that **AM/PM/MI/IS** Multimeter. Takes only seconds, but it could make the big difference next time you open up the car and want to make it with the rest.

When you turn off the **20000 AMP** FLUX leads, be sure it is **OFF**. One way to do this is to turn it off all the way—clockwise—till you feel and hear a click. Then it's **OFF**. Besides, it's impossible to put the meter in place unless that knob is in the **OFF** position.



And even then to slip the meter on, you might have one small but kind of important item to mind. Drop your eyeballs toward the lower left-corner of the front panel. The marking of that **FUNCTION** **KEY** **SWITCH** should not be at **0**. Any other one. But not **0**. If you're why:

There's a good chance that when the test leads are wrapped up and tucked into place—and the cover changed on—one of the prongs might touch the metal cover. Pretty hard to avoid, as a matter of fact. And it's OK as long as the **FUNCTION** switch is not on **0**.

But if not—**0** then watch it as **0** and if a prong touches the metal cover—then a circuit is completed. Good! Another will drain the life out of the battery faster than anybody wants to think about.



This kind of PM will mean a lot to your machinery, and pay dividends for everybody right on down the line.

## When the Worm (Gear) Turns



So that's what's been happening, eh?

The gears in your Telespinner Set has been 'jumpy' a little. Maybe not springing right. A little wobble, both sides. Some lines look sort of ragged, with too much space between some characters and others squeezed together.

Happens on the AN/EGC-10 and AN/EGC-15 Telespinner Set—on their Telespinners TT-08/04, TT-09/05, TT-100/06, TT-107/04 and TT-118/04. To mention a few.

It's all because the driving worm gear meshes with the mesh on the carriage lead drive gear. You see the two of them in the rear of the printer.

Using those two gears too close up about center with each other, you're going to end up with somewhat gear ... rapid wear ... and visible evidence on the paper of what happens when those gears don't get together right.

All a repairman needs is maybe a couple of hands and 12 or 15 seconds to line 'em up.



Before the set goes in the desk case, line out a pull-pull machine on the carriage lead drive gear. First push it forward until it's tight. Then pull it to the rear until it's tight.



There's a little "gap" in there. Sometimes around 1/16. In the slip it becomes the carriage lead drive gear at midpoint between the forward position and the rear position.

Things get a little eye-raising about now, in case of confusion that the distance between the back face of the carriage lead drive gear and the meshed surface of the base casting is about 1/16 inch. But that distance will vary maybe three or four or five thousandths from one printer to another.

Ease the gears up—and when they're locked, each other again in the eyeball the carriage feed drives gear in place and slide the shaft roller against it. And tighten the roller set screws.

Wrap things up by checking two related adjustments—like mentioned in the TM. One on the carriage feed shaft nut, wheel and the other on the carriage feed shaft drive shaft roller.

And your spring problems are squared away.



## ~~Lay It Steady~~

Even though a good experimenter handles his construction/repair equipment with a firm, gentle touch, there's always a chance of a slip or a job that might lead to trouble.



Like when you slide out the Junction Panel of the Amplifier-Filter Regulator AM-701/TCC-7 on your AM/TCC-7. Sliding it out is no risk, but setting it down on the bench or floor is when you might run into some trouble.

So happen that the E-100 insulator on the bottom of the Junction Panel sinks down a little too far for comfort—or safety. It causes just about as big a problem as the panel is laid down on a flat surface.

A life lesson, then, when handling the panel. Either prop it up on the insulator chain the bench, or lean it firmly against a support to keep the insulator in shape.





## Robbing The Gracie

What are you doing?  
Robbing a Gracie?

Yes.



1. All doors closed?  
"Yes."



2. All windows off?  
"Yes."



3. Alright, who's the  
T-9's Assistant?  
"Me!"



4. I said, where's the T-  
9's Assistant?  
"Oh, in its cradle."



5. Where?  
"In its cradle on the  
group panel of the AM-  
200/T0007."



6. Where?  
"Like I said, in its cradle  
on the group panel."



7. You think if they pull  
handles even though we've  
got enough country to coast  
between here and there?  
"Yes."

Then, he takes a HANDLE INTO THAT HOLE AND PULLS THE  
T-9'S OUT OF ITS CRADLE, AND THEN PUT IT WHERE IT'S  
SUPPOSED TO BE DURING THE PULL-IN THE BRACKET ON THE  
TOP OF THE CRADLE OF THE GRAB WIRE AT 000/T0007.



BECAUSE IF NOT, THE HANDBY WILL  
POP OUT OF THE CRADLE ON THE HANDBY  
WIRE AND CRASH INTO... AND PREVENT  
THE PULL-IN THE T-9'S. BECAUSE  
THE HANDBY WIRE IS THE GRAB WIRE.  
AND THE GRAB WIRE IS THE  
HANDBY WIRE.



## Snap It Right

"I unplugged  
cables, removed  
cass in the  
alarm sound  
circuitry."

"I didn't realize  
that, sorry, but I  
didn't know I  
did that."

So how complicated can a snap catch get?

The kind used on all these different cases used in putting up signal equipment. They're either snapped shut when the cases are closed or they're snapped open when the alarm goes in alarm use and put up work.

All simple enough.

But here's the catch. These cases close up-righter than a clam. And the pressure on the snap catches to keep the cases closed right is pretty heavy. Which makes life rough enough on them.

And their life can be chopped short if they're handled like somebody's head in their. The sides being, of course, to fit together the two sides of the case as carefully as possible (get all the cables, etc., tucked in) and then close up the snap catch firm and fairly fast.

Comes now a special kind of thing to watch.

And that is there are two kinds of snap catches. One kind that can be fixed by your own work if it breaks or gets loose. And another kind that can be replaced only by sending the case outside the unit. All the way back to the shop.

It's all inches these snap catches are attached to the side of the case—either by a screw (snap catch) or a couple of rivets (non-snap catch).

For example, the snap catches on the Transmitter Case CT-101/TRC are screwed into place. Easy enough to tighten up or even replace that screw if the snap catch shows no signs of shifting.

But the snap catches on the Accessory Receiver Case CT-105/TRC are riveted in place. And if they work loose or break off—the case has to go out from the repairman and back to the shop for a new snap catch—or catches. Not good.

So you might check your case. See what kind of snap catches they have. And treat them all with care.



## Red Good and Clean

See that there hand-held warning screen?

The red that binds the hand-wheel on the TA-15 and TA 50/PT sub-planned. It needs a little warning.

How many messages is the man up-forward-or-up-never-gets-going to be able to send if he can't count his phoned-Mighty embarrassing when he goes to ring up somebody and CLUNK... the whole assembly drops into his empty tank.

All because the warning screen didn't work.

It's one of those things a man can't tell you by looking at it—like you can tell a cracked case, corroded battery or forged cord by a quick visual check.



Before heading for the field, then, do yourself and your work a good turn by taking a few turns with a screwdriver on that warning screen. A few seconds of screwing will pay off later in hours of good singing operations.

## Shack Up Vibrators

Yep. Yep. It's tricky, crowded, cramped and generally a *damn-foolish* kind of complication.

And any big equipment who has ever had to shake loose the vibrators (H, H2, H1) in a PP-105/228 or PP-112/228 Power Supply sometimes gets the *crutch* just *thinkin'* about the task.

One thing's for sure. There's just not enough finger space inside the chamber of those power supplies to do a neat pluck job, especially because you need a good spread life.

In the shared back-sockets slip a *war-saw-like*—very *curved* like—twist vibrator and rock. And a gentle pry is all it will need to free the vibrator from its *nest*.

When it's free enough for freedom, just tilt it toward the side of the unit and lift 'er free.



## Felt Head



Sometimes the old work bench can be out of hand when a repairman sets down a radio chassis or a few tubes or almost any electronic gear. Hard enough, a "wobble" of feet, or damage some of the more delicate equipment.

Some simple screwing should set a repairman up with a good sized piece of felt to put right there on his work bench. That felt will smooth the job . . . make things a bit quieter . . . and even look a little better.

## Coiled Cord

It's awfully easy to get an radio or foot on something mounted in the rear of your handy Blunder B-33/PT.

It hangs down and curls around and generally gets in the way—unless you back off a full foot from your radio gear. Not likely.

Now you might say there's one way out of the dilemma. For one thing, try keeping the cord over any nearby hook or ledge until, all your hands are ready for replacement (and out a signal for the new type now in supply).



Now you wouldn't the man say? What else? A handy, practical, curled hook. The kind that stretches out as far as you need and then curls up unobtrusively so's no way out of the way when the phone talk is finished.

The same kind you find on most six-tube-type telephones.



But make sure you requisition the "B" model of the B-33. It's the only one with the retractable cord. And they're available in supply now, too.



Test each battery with your low-voltage circuit tester. Hook up the leads so you'll draw current from the battery through the load bank. Then test the rated capacity of the battery—10 amps for the 40% and 20% for the 20%—for about 10 seconds. Don't allow for any small difference and let the battery output be even.



Then read the voltage—which'll be lower than the battery's no-load voltage.

For example, supposing you check out four batteries and the manufacturer reads

MS. 1-11.07 VOLTS  
MS. 2-11.00 VOLTS

MS. 3-11.80 VOLTS  
MS. 4-8.20 VOLTS OVER 11.7000

If it's your idea to match Nos. 1 and 3 and your second choice is Nos. 2 and 4, drop out the big, black sign. Pair 'em off this way and you're almost sure to get more life out of your batteries.

## Let's Keep It Clean



Things aren't happening with the battery if it isn't kept clean. Here are some signs of a dirty battery and what to do about it:

1. **Electrolyte leaks**—this results from acid fumes given off through the vents or from spilled or overflowed battery acid.

When top acid liquid is left to dry or wiped off it leaves these electrolyte salts. These salts in turn will pick up moisture and in this combination they drain current like a siphon did in a derelict boat.

It doesn't take too much to stop this. First, when you wash your vehicle, hose the batteries and curriers with lots of clean water. Never, but never, use a steam cleaner.

If your currier and battery are dirty, get 'em out, make sure the battery caps are tight and give everything a good scrub down with a scrub brush and a solution of baking soda and water—one pound of soda in one gallon of water is plenty for a half-dozen vehicles. (FBIW 68-204-6814, Auto Finchems, Trucksmith will get you a 1-1/2 lb. can.) Let the soda solution sit on the battery until all the foaming stops, clean it off with clean water and try again. When there's no more foaming you've neutralized all the acid on the battery and the currier. Rinse away more with fresh water and let dry.

Remember, if the caps aren't tight—the soda can get into the battery and neutralize acid just as fast inside the battery as well as outside.



**2. Cable terminals**—As long as you've got the ends handy, clean the cable terminals and check them, too. These come in brass, zinc, or steel. If you haven't any tools at the moment, you can get by using lots of fresh wax.



**3. Paint the under-deck type of joint** is better than leaving the bare metal of the wire exposed, but mild-weather paint is better than any other paint. FOR BOND PRU-2211, Impregnated, White Zinc, which type is available from the supplier.

**4. Check the case**—While you get it out, inspect for leaks, cracks, signs of drying and anything else that looks suspicious.



**5. Don't over-charge**—Remember to put a light coat of grease on the battery posts and the cable terminals after they're connected. One don't think that it might seem a good heavy coat of grease is even better. No oil—just use a zinc-oil.

**6. Make sure the terminals are slightly fastened.** If they should be fastened right on the case, clean and slicked down with G.R.



## Words of Caution



Here's what to be on the lookout for and what not to do if you're checking around batteries:

**1. Check over battery cable insulation**—is it frayed or worn? If bare cable can make a short circuit or a fire.



**2. Tighten just right**—The connection at the battery post, that is, but be careful in the other direction, too. You don't want to over-tighten 'em either 'cause this will crack the legs.

**3. Starting a fire**—And that's usually what you can do when you light a candle or flash a spark near a battery. Here's why: Hydrogen gas (which is highly flammable) is given off by the battery when it's being charged or discharged. And you get some gas floating around all the time even when the battery's not working.



**4. Avoid "brights"**—A battery can develop the disease if the voltage regulator is not too high. Take in the generator being put out, the battery will charge and heat up. So check your TR for your vehicle's correct regulator setting.

Another thing don't put a sliver sliver on your battery is removing the battery when its electrolyte level is below the top of the plates. The plates will corrode and swell—and buckle. Then, losing the specific gravity can cause it freezing

temperature can also distort the case. Clogged up vents in the battery caps will cause pressure to build up inside and cause at least the battery gasses up the glass.

8. Never jump a battery that reads more than 21 points between cells.

### Operational Tips



1. Removal—To take out your battery, first turn off all circuits and then disconnect the ground cable. If you're not sure all circuits are off, remove the battery area and disconnect the ground cable at the frame. If a spark does occur it'll be at least a cable length away from the battery. Now, if you should happen to touch the vehicle with your wrench when you unhook the positive cable you won't get a short circuit and the possibility of a burn.



2. Hook-up—After you set the battery on the vehicle, position so the negative post lead should line up with the negative side. If you're in doubt, as to what leads to what, check your vehicle's EM for the right hook-up.

Then, tighten the hold-down bolts. Make sure sure that these bolts are just right. Not too tight or you strip the threads but right enough so's the battery is held firm. If you tighten the hold-down bolt too much you can also cause a cracked or distorted battery. That'll cause leaks when the sealing is broken.



Okay, so now the first cable you hook up to your positive cable and then your negative cable.

3. adding water—In using the syringe you'll be able to help just how much water to add and no more and not too little (get enough because up in the syringe there's lead in the battery water of military batteries. If they're conventional in the old EM to 1/2 inch over the plate.



### Be Careful



If you get acid on your clothes—you can't do much except change 'em and don't let it seep into some hole (believe it or not) unless. If you get any acid on your body—wash yourself with much water and expect to a doctor. Your shop probably has an





eye-winking locomotive is a joyful walk substitute. Leave a child's direction to you; you have to help yourself as a buddy.

When working around batteries it's always a good idea to wear rubber gloves and battery aprons.

Don't mess around . . . If your battery is leaking, get a new one.



### Cold Weather Whoppers



The greatest enemy to your battery is cold weather . . . so you get to be extra careful when the night comes on.

Of course, the best way to protect your battery from freezing is to make sure it's fully charged. And you want to do that by checking it as many times as you get a chance without interfering with your mission.

Suppose you can't start your vehicle or can't get a long, long ride after a cold start. Take your batteries into a warm place or put 'em on charge. Otherwise, they'll freeze up on you.

Also, the colder the battery gets, the less charge you can get out of it. So there's another reason you might want to get the battery out of the vehicle on a cold, cold night. A warm battery has a much better chance of starting. If this can't be done: Try warming the battery before starting your vehicle. This never do this first: let speed build to move get it warmer than you can put your hand on it. TB 0023 100 (18 Jul 10), including Change 1 (26 Jun 54), with you have to use the Mill close kit to heat your batteries.

But all this business doesn't have to be done unless the outside temperature is going to be well below zero. A battery that has been taken care of will start a well-maintained vehicle down to 10° below zero without special treatment.

THE FREEZING POINT OF ELECTROLYTE AT VARIOUS SPECIFIC GRAVITIES WILL SHOW YOU WHY!

**BATTERY ELECTROLYTE  
SPECIFIC GRAVITY  
(AT CORRECTED TO 80° F.)**

- 1.000 (water)
- 1.100
- 1.150
- 1.200
- 1.250
- 1.275-1.280

**WILL FREEZE AT  
THESE TEMPERATURES**

- +10°
- +10°
- +7°
- 10°
- 40°
- 50° to -55°



As you can see, the temperature would have to go so low that a brown monkey would be in severe pain before your battery would freeze when it's fully charged.

Don't go adding water to the battery in cold weather unless you're going for a long run 'cause the water will freeze in the battery.

But that doesn't mean old Jack Frost doesn't take his due. Even with a fully-charged battery at zero degrees you only get about 60 per cent of the cranking power you'd get from the same battery at 80° F. The battery current, as you know, comes from a chemical reaction and the cold slows down that reaction—and there ain't a chemical thing you can do about it.

In cold weather it takes your engine to start takes about 17% more cranking time than it does at 80° F. In you only get 60 per cent of the cranking power at a one degree day compared to the normal amount at an 80° day.



The same battery that makes it harder to get power out of the battery makes it just as hard to get a charge into the battery—in other words the battery now wants sleep for this kind of operation.

## BLOOMIN' MASK



Has your protective mask turned "bloomin' pink?" Well, ... this pink, or "bloom" is caused by an age resistor just in the rubber compound when the mask's made and'll cause no harm. A pink mask is OK unless it's sticky or has cracks and leaks. This pink condition isn't considered to be a defect under Change 1 (2 May 57) to SB-1-38-11.

While you're reading this Change 1, it might be a good idea to take a look at the small print there. It says that if your mask is exposed to direct sunlight it'll have a tendency to discolor. The amount that it changes color depends upon how long it's in the sun and how hot the sun is. It'll get a light green or light brown in color. So-keep those masks out of the sun.

Another thing to stay clear of is using carbon for to clean your mask. It may remove the dirt all right, but what it'll do to that mask shouldn't happen.

# Comic Rodd's

## BRIEFS



### Not attractive

Any time you have to clean the magnesium in your engine set, clear clear of steel wool. The magnet part of the mangle will draw the shavings of steel wool...and when they stick to the bearing parts, you just won't have any insulation. Use brass chain instead. And if cleaning powder will wash, you can use that.

### The coil's the thing

Caution...watch it...think. You're used where you can stick a higher-rated fuse in the place of a lower-rated one as long as the amperage is the same. That's right. But don't put a lower-rated voltage fuse where a higher-rated one belongs—even though the amperage is the same. Fire is waiting.

### Swag, wrong number

If your M44 SP 90mm Scorpion machines are about to order the M44's Fuel Injector, assembly listed on page 17 of TM 9-2338-213-20P...use PMA 2415-271-075P.



### Getta nylon released?

Hey, there! You with the new nylon tapes 100 released that you wasn't designed for friggin' in field duty, so you're gotta be mighty careful with it. You wear it with your Dues. It works as an apparel, she likes only. Carrying it around under your belt, for example, can punch holes in it. You'll see either the synthetic rubber, double 100 released, or a promise in the field. Oh, Director 275.27 (7 July 84) gives you the real lowdown.

### Keep the spring

The magazine spring which is a part of the increased magazine used on the M44's. Because Sporting Rifle 44 is in that supply. So when you have an uncomfortable magazine assembly better hang on to the spring PMA 2415-275-241B, so you can repair after major time.

### It's in the 75

What a very good idea will might to have a copy of TM 9-1400-401-30 (24 Oct 80). The 75 gives a complete maintenance of interconnecting cables.

**Would You Stake Your Life on the Condition of Your Equipment?**

# ROLL OUT THE RED CARPET FOR A V.I.P.\*



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